



Safe Transport of Dangerous Goods by Air

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Your safety is our mission.







Safe Transport of Dangerous Goods by Air

Shipper's responsibilities



Doc 9284

Technical Instructions for the Safe Transport of Dangerous Goods by Air

2019-2020 Edition

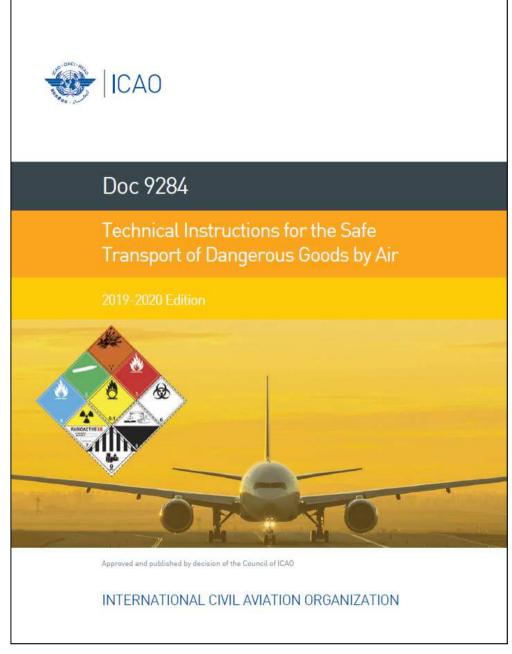


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INTERNATIONAL CIVIL AVIATION ORGANIZATION



SAFE TRANSPORT OF DANGEROUS GOODS BY AIR



- **Part 5** = Shipper's responsibilities
- √Chapter 1 General
- √Chapter 2 Package markings
- √Chapter 3 Labelling
- √Chapter 4 Documentation

It is the <u>shipper's responsibility</u> to ensure that all of the applicable air transport requirements are met

- → Before a person offers any package or overpack of dangerous goods for transport by air, that person <u>must ensure</u> that:
- > the articles or substances are not forbidden for transport by air
- > the goods are properly classified, marked, labelled and in a condition for transport as required by the Instructions
- > the dangerous goods are packaged in compliance with all the applicable air transport requirements regarding:
- √ packagings (appropriate types, quantity, closure, compatibility, ...)
- √ marking
- ✓ documentation
- **√** ...



- > Shippers have to apply special provisions regarding Class 7 (radioactive) shipments:
- ✓ multilateral approvals for certain B(M) packages or containing fissile materials
- √ approval under special arrangement (approval by a competent authority)
- ✓ prior the commencement of the shipment, notification (without acknowledgement) to all competent authorities, each time a shipment requires an approval
- √ determination of Transport Index (TI) and Criticality Safety Index
 (CSI) (Part 5; 1.2.3)
- > Certificates issued by competent authorities are required for design, special arrangements and certain shipments
- √ The certificates must confirm that the applicable requirements are met, and for design approvals, must attribute to the design an identification mark
- √ The shipper must be in possession of a copy of each applicable certificate



- > Information to employees:
- ✓ shippers must provide such information to employees as will enable them to carry out their responsibilities with regard to the air DG transportation
- > Training of involved personal
- ✓ before a DG consignment is offered for air transport, all relevant persons involved in its preparation must be trained with regard to their responsibilities
- ✓ in case the shipper doesn't trained staff, the term "relevant persons" is applied to any sub-contractor working on behalf the shipper, and the sub-contractor's staff is undertaking the shipper's responsibilities
- → However, such persons must be trained as required by Part 1, Chapter 4 (training requirements)(IATA Part 1;chapter 5)



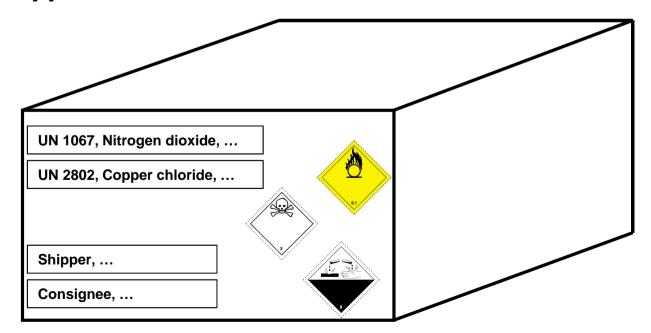
- > Provisions for salvage packaging:
- ✓ before offering any salvage packaging for transportation, a shipper must ensure that:
- it is properly marked (shipping name & UN Number) and labelled
- it is also marked with the word "Salvage" (at least 12 mm high)
- -The words "Salvage package" are added after the description of the goods in the DGD (shipper's declaration)
- > Provisions for empty packaging:
- ✓ Other than Class 7, each packaging which previously contained DG must be identified, marked, labelled and placarded as required it has been cleaned, purged of vapours or refilled with a non-dangerous substance (nullifying any hazard)
- ✓ A packaging which had previously contained an infectious substance must be disinfected or sterilized to nullify any hazard, and any label or marking must be removed or obliterated (before returning to the shipper or sending elsewhere)
- ✓ Class 7 empty packaging must not be used for the storage or transport
 of other goods unless decontaminated



- > Provisions for mixed packaging:
- √ When two or more dangerous goods are packed within the same outer packaging, the package must be labelled and marked as required for each substance
- ✓ Labels need not be applied for a subsidiary risk if the hazard is already represented by a primary risk label
- ✓ Example: Nitrogen Dioxide UN 1067 *Primary risk: 2.3*

Subsidiary risk: 5.1 & 8

+ Copper Chloride - UN 2802 - Risk: 8





→ Unless otherwise provided in the Instructions, DG packages and overpacks containing DG carried by air <u>must be marked</u>!

- > Required markings:
- ✓ must not be covered or obscured by anything
- ✓ must be durable, printed (or marked on or affixed to) to the external surface of the package
- ✓ must be readily visible and legible, displayed on a background of contrasting colour
- ✓ must be able to withstand open weather exposure without a
 substantial reduction in effectiveness
- ✓ must not be located with other package markings that could substantially reduce their effectiveness
- Prohibited markings and labelling
- ✓ Arrows for purposes other than indicating proper package orientation must not be displayed on a package containing liquid dangerous goods



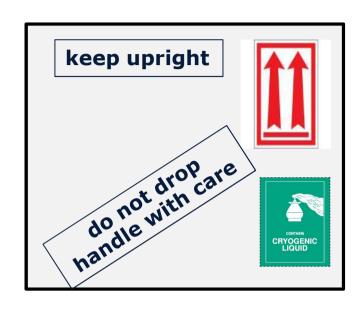
- > Proper shipping name and UN (or ID) number
- ✓ The proper shipping name of the DG (supplemented with the technical name if appropriate) and, when assigned, the corresponding UN number preceded by the letters "UN" (or "ID")
- → Example: Corrosive solid, flammable, n.o.s. (brule-tout) UN 2921
- ✓ For solid substances, if the word "molten" is already included in the proper shipping name, it must be added on the package
- ✓ For explosives, the proper shipping name may be supplemented by additional descriptive text to indicate commercial or military names
- > Shipper and consignee identification
- √ The name and address of the person who offers the dangerous goods for transport by air and of the consignee must be provided on each package, near the proper shipping name
- > Markings must be stamped, printed or otherwise marked on the package to provide adequate permanency



- > Special marking requirements
- → Radioactive material
- √ package with a gross mass > 50 kg must have its permissible gross mass legibly and durably marked on the outside of the packaging
- √ "Type A", "Type IP-1", "Type IP-2", "Type IP-3" must be legibly and durably marked on the outside of the packaging for such design packages
- ✓ package conforming to a design approved by competent authority must be legibly and durably marked on the outside of the packaging with
- identification mark allocated to that design by the competent authority
- serial number to uniquely identify each packaging which conforms to that design
- "TYPE B(U)", "TYPE B(M)" or "TYPE C" when appropriate
- Trefoil symbol marking

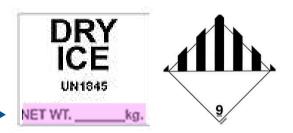


- > Special marking requirements
- → Refrigerated liquefied gas
- ✓ In addition to arrows used for package orientation on at least two opposite vertical sides, the wording "KEEP UPRIGHT" must be placed at 120° intervals around the package or on each side. Packages must also be clearly marked "DO NOT DROP HANDLE WITH CARE"



→ Dry Ice

✓ net mass of solid carbon dioxide (dry ice) must be marked on any package containing such substance



- **→Biological Substances, Category B**
- ✓ packages must be marked "Biological substance, Category B".





- > Special marking requirements
- → Environmentally hazardous substances
- ✓ UN 3077 & 3082 packages must be marked with the "environmentally hazardous substance mark" (in addition to the Class 9 label)



- **→ Explosives**
- √ The proper shipping name may be supplemented by additional descriptive text to indicate commercial or military names
- e.g. UN 0181 Rockets with bursting charge Exocet B1
- → Chemical oxygen generators
- ✓ PBE have to be transported under provision of SP A144, and the statement "Aircrew protective breathing equipment (smoke hood) in accordance with Special Provision A144" shall be marked adjacent to the proper shipping name



- > Special marking requirements
- → Packages containing lithium cells/batteries prepared in accordance with:
- Section II of Packing Instructions 965 to 970
- Section IB of Packing Instructions 965 and 968

must be marked



- → the mark must indiquate:
- ✓ UN 3090 for lithium metal cells or batteries
- ✓ UN 3480 for lithium ion cells or batteries
- √ UN 3091 for lithium metal cells or batteries contained in/packed with equipment
- ✓ UN 3481 for lithium ion cells or batteries contained in/packed with equipment

Where a package contains lithium cells or batteries assigned to different UN numbers, all applicable UN numbers must be indicated on one or more marks

✓ a telephone number for additional information



- > Special marking requirements
- → lithium cells/batteries mark

* UN Number(s)

** Phone Number





Since 1st of January 2019, the old handling label is not permitted at all!



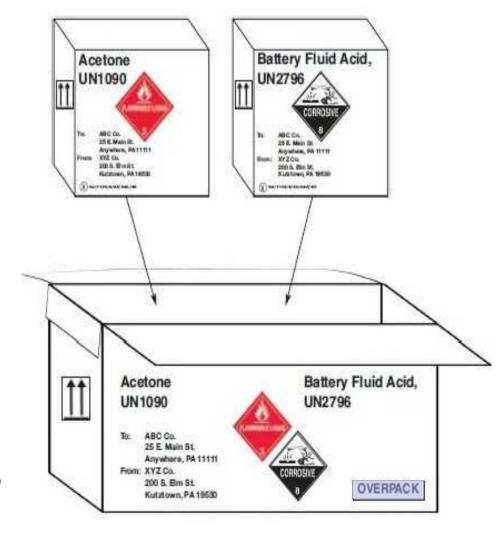


> Special marking requirements:

→ Overpacks:

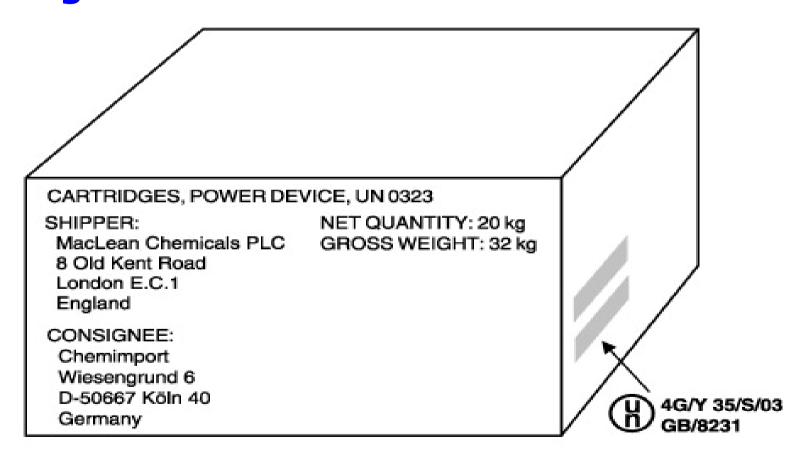
✓ They must be marked with the proper shipping name, UN number, and special handling instructions appearing on interior packages of for each item dangerous goods contained in the overpack, unless markings and labels representative of all dangerous goods in the overpack are visible

Note: From the 1st of January 2016, the lettering of the "Overpack" marking must be at least 12 mm high





- > Special marking requirements
- → Language to be used
- ✓ in addition to the languages which may be required by the State
 of Origin, English should be used





- > Special labelling requirements:
- √ when required, each DG package must be affixed with a danger class label, and, if any, a subsidiary risk label
- ✓ these labels must bear the class or division number on them
- √ all labels must be able to withstand open weather exposure without a substantial reduction in effectiveness
- √ when primary and subsidiary risk labels are required, they must be displayed next to each other
- ✓ Each label <u>must</u>:
- be affixed to a background of contrasting colour or must have a dotted or solid line outer boundary
- be located on the same surface of the package near the proper shipping name marking
- be affixed at an angle of 45° (diamond shaped), unless the package dimensions are inadequate
- not be covered or obscured by any part of or attachment to the packaging or any other label or marking

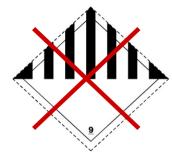


- > Special labelling requirements:
- ✓ Labels must not be folded. Cylindrical packages must be of such dimensions that a label will not overlap itself
- ✓ If the dimensions of the package are such that two identical labels cannot be affixed without overlapping each other, one label is acceptable provided it does not overlap itself
- ✓ Labels must be firmly affixed to or printed on the package of DGs. Where a package is of such an irregular shape that a label cannot be affixed to or printed on a surface, it is acceptable to attach the label to the package by an adequately strong tag



- > Special labelling requirements:
- ✓ Since packages or consignments of magnetized material (Class 9) must bear the "Magnetized material" label, and do not need to bear the Class 9 label





√ when the package containing the dangerous goods may <u>only</u> be transported on a <u>cargo aircraft</u>, the "Cargo aircraft only" label must be affixed



Note: Where the packing instruction number and the permitted quantity per package are <u>identical</u> for <u>passenger and cargo</u> aircraft, the "Cargo aircraft only" label <u>should not be used</u>



- > Special labelling requirements:
- ✓ Packages containing refrigerated liquefied gases, the "Cryogenic liquid" label must be affixed on all packages













- > Special labelling requirements:
- ✓ Packages containing lithium batteries that meet the requirements of Section IB of Packing Instructions 965 and 968 must bear both a "Lithium battery" handling label and a Class 9 hazard label





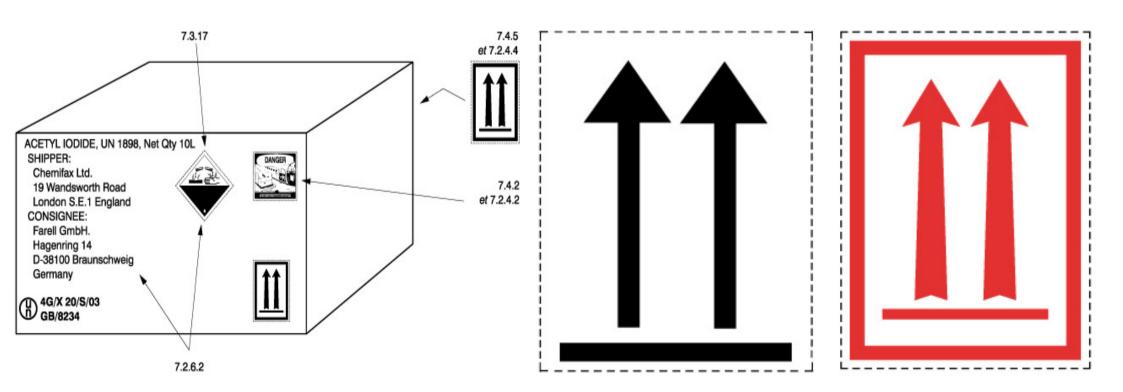




> General requirements:

✓ The "Package orientation" label, or preprinted package orientation labels meeting the same specification, must be affixed to or printed on at least two opposite vertical sides of the package with the arrows pointing in the correct direction

The words "Dangerous goods" may be inserted on the label below the line

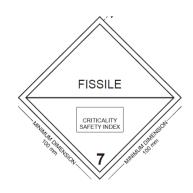




- > Special requirements for Class 7 Radioactive Material:
- ✓ Except when enlarged labels (200mm X 200mm) are used, each package, overpack and freight container containing radioactive material must bear the radioactive labels according to the appropriate I, II or III category
- ✓ Labels must be affixed to two opposite sides on the outside of the package, or on the outside of all four sides of a freight container

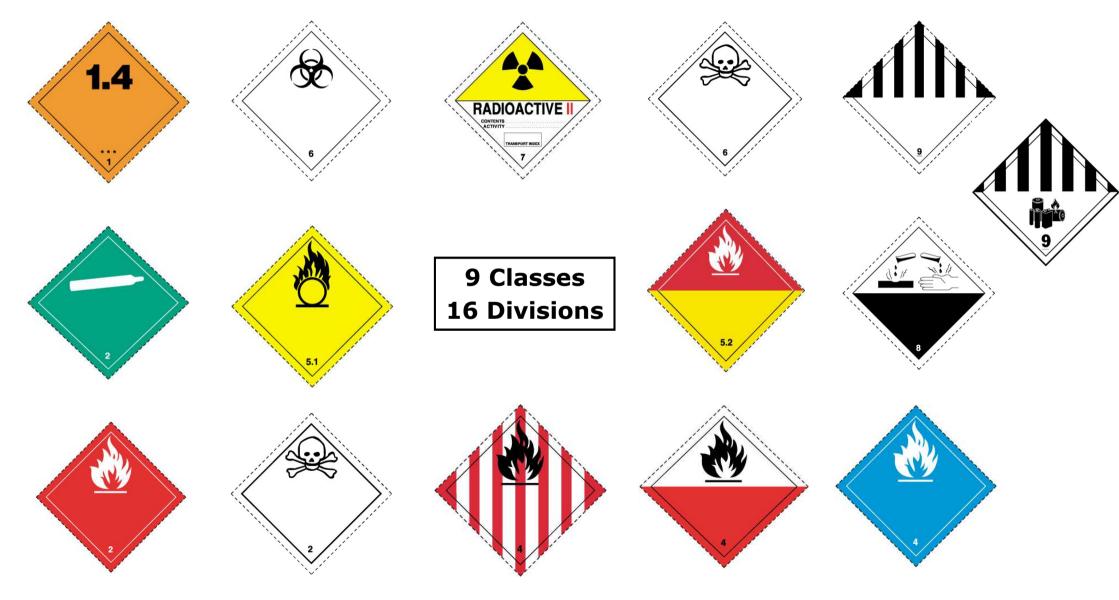
RADIOACTIVE I

- ✓ Each overpack containing radioactive material must bear at least two labels on opposite sides of the outside of the overpack
- ✓ In addition, each package, overpack and freight container containing fissile material, other than fissile material excepted, must bear "fissile" label, adjacent to the required labels



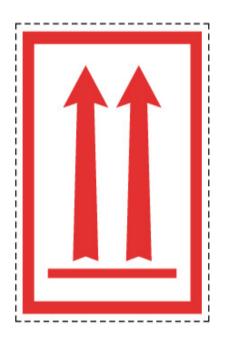


> Hazard labels - Examples





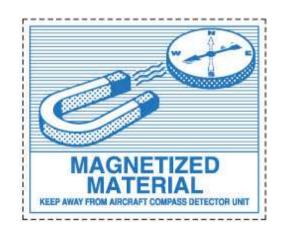
> Handling labels















> General:

- ✓ The person who offers dangerous goods for transport by air must provide the information to the operator by means of a paper document or, where an agreement exists with the operator, by Electronic Data Processing (EDP) or Electronic Data Interchange (EDI) transmission techniques
- √This document is called "Shipper's Declaration for Dangerous Goods" or DGD



- ✓ Where a paper document is used, the shipper must provide to the operator two copies, completed and signed of the DGD
- ✓ Where the information is provided by EDP or EDI techniques, the data must be able to be produced as a paper document without delay

Note: A dangerous goods transport document may be in any form, provided it contains all of the information required by the Instructions



- > Information required on the DGD:
- ✓ name and address of the shipper and the consignee
- ✓ UN or ID number preceded by the letters "UN" or "ID" as appropriate
- √ proper shipping name, including the technical name enclosed in parenthesis, as applicable
- √ primary hazard class or division (including compatibility group for Class 1)
- ✓ subsidiary hazard class or division
- √ packing group (where assigned)
- > Example:
- ✓ UN 1992 Flammable liquid, Toxic, n.o.s (Petrol, Carbon tetrachlorid mixture) 3 (6.1) III
- ✓ UN 1717 Acetyl chloride, Class 3 (Class 8), PG II
- ✓ UN 2411 Butyronitrile 3 (6.1), GE II

Note: this order shall be respect



- > Information required on the DGD:
- √ number of packages, type of packaging (e.g. steel drum, fibreboard box, etc.) and net quantity of DG in each package (by volume or mass)
- > Examples:
- ✓ UN 1263, Paint, 3, PG II, 5 fibreboard boxes x 5 L
- ✓ UN 1263, Paint, 3, PG II, 5 fibreboard boxes (4G) x 5 L
- ✓ UN 1263, Paint, 3, PG II, 5 fibreboard boxes x 5 L, 3 plastic drums x 40 L
- ➤ Gross Mass: <u>when</u> the <u>letter</u> "G" follows the quantity in column 11, gross mass of each package must be indicated, rather than the net quantity, for:
- √ limited quantities
- ✓ shipments made under provisions of Section IB of Packing Instruction
 965 (UN 3480, Lithium ion batteries) and Packing Instruction
 968 (UN 3090, Lithium metal batteries)
- Except when indicated 30 kg G where different dangerous goods are packed together in the same outer packaging
- → net quantity + gross mass of the completed package!



- > Information required on the DGD:
- √ for empty uncleaned packagings, only the number and type of packagings need be shown
- √ for chemical kits and first aid kits, the total net mass of dangerous goods
- √ for dangerous goods in machinery or apparatus, the individual total quantities of dangerous goods in solid, liquid or gaseous state, contained in the article
- ✓ for dangerous goods transported in salvage packagings, an estimate of the quantity of dangerous goods must be given, + the words "Salvage package"
- √ for explosive articles of Class 1, the net quantity indicated for each package must be supplemented with the net explosive mass (abbreviations "NEQ", "NEM" or "NEW")
- √ for fireworks (UN 0336 or UN 0337), a classification reference issued by the appropriate national authority



- > Information required on the DGD:
- ✓ for chemical oxygen generators contained in protective breathing equipment (PBE) transported under SP A144, the statement "Aircrew protective breathing equipment (smoke hood) in accordance with Special Provision A144" must be included on the dangerous goods transport document
- ✓ for self-reactive substances of Division 4.1, or organic peroxides of Division 5.2 or other substances having similar properties, the shipper must indicate on the DGD that the packages must be protected from direct sunlight and all sources of heat and be placed in adequately-ventilated areas (Application of SP A20, + special conditions for non-listed 4.1 & 5.2 when approval is required, and for sample of 4.1 & 5.2 see 4.1.5.4)
- √ for infectious substances (UN 2814 and UN 2900) and controlled substances, the name and telephone number of a responsible person



- > Information required on the DGD: Radioactive Material
- √ name or symbol of each radionuclide, (for mixtures of radionuclides, appropriate general description or a list of the most restrictive nuclides)
- ✓ description of the physical and chemical form of the material, or a notation that the material is special form radioactive material or low dispersible radioactive material
- √ maximum activity of the radioactive contents during transport, in units of becquerels (Bq) with an appropriate SI prefix symbol For fissile material, the mass of fissile material in units of grams (g)
- ✓ category of the package, i.e. I-WHITE, II-YELLOW, III-YELLOW
- √ transport index (categories II-YELLOW and III-YELLOW only)
- ✓ CSI criticality safety index, where applicable
- ✓ identification mark for each competent authority certificate of approval for the shipment (special form, low dispersible, fissile excepted, special arrangement, package design, or shipment)
- ✓ ... see 4.1.5.7



- > Information required on the DGD: (additional requirements)
- ✓ DGD must also contains:
- -for lithium batteries Section IB of Packing Instruction 965 or Packing Instruction 968, the letters "IB" must be added following the packing instruction number
- when applicable, reference to Special Provision A1, A2, A4, A5, A51, A78, A190, A191, A201, A202, A208, A211 or A212
- a statement indicating that the shipment is within the limitations prescribed for either passenger and cargo aircraft or cargo-only aircraft, as appropriate
- special handling information, when appropriate
- an indication that an overpack has been used, when appropriate
- the "Q" value rounded up to the first decimal place, when appropriate
- ➤ Each time an Approval or Exemption is needed, a copy must accompanied the DGD (i.e. SP A1 or A2, Portable Tank as state in S-4, alternative packagings, not-listed 4.1 & 5.2)



- > Information required on the DGD:
- ✓ DGD must include a Certification or Declaration

"I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations."

✓ For air transport the following additional statement is required:

"I declare that all of the applicable air transport requirements have been met."

- ✓ The certification must be signed and dated by the shipper
- √ Facsimile signatures are acceptable where applicable laws and regulations recognize the legal validity of facsimile signatures.



- > Information required on the DGD:
- ✓ If the dangerous goods documentation is presented to the operator by means of EDP or EDI transmission techniques:
- -the signature(s) may be electronic signature(s) or may be replaced by the name(s) (in capitals) of the person authorized to sign
- as the consignment is transhipped to an operator that requires a paper dangerous goods transport document, the operator must ensure the paper document indicates "Original Received Electronically" and the name of the signatory must be shown in capital letters

- →In addition to the languages which may be required by the State of Origin, English should be used for the dangerous goods transport document
- → shipper must retain a copy of the DGD (at least 3 months), and be able to reproduce it in a printed form when kept electronically or in a computer system



SHIPPER'S DECLARATION FOR DANGEROUS GOODS Shipper Air Waybill No. 800 1234 5686 ABC Company 1000 High Street Page 1 of 1 Pages Youngville, Ontario Shipper's Reference Number Canada Consignee For optional use CBA Lte for 50 Rue de la Paix Company logo Paris 75 006 name and address France Two completed and signed copies of this Declaration must WARNING be handed to the operator Failure to comply in all respects with the applicable TRANSPORT DETAILS Dangerous Goods Regulations may be in breach of This shipment is within the Airport of Departure the applicable law, subject to legal penalties. limitations prescribed for (delete non-applicable) Younaville PASSENGER CARGO AIRCRAFT AND GARGO ONLY Shipment type: (defete non-applicable) INON-RADIOACTIVE: I-RADIOACTIVE Airport of Destination: Paris, Charles de Gaulle NATURE AND QUANTITY OF DANGEROUS GOODS

	Dangerous Goods Identificatio					
UN or ID No.	Proper Shipping Name	Class or Division (Subsidiary Risk)	Pack- ing Group	Quantity and type of packing	Packing Inst.	Authorization
UN3226	Propyltrichlorosilane Self-reactive solid type D (Benzeresulphonyl hydrazide)	8 (3) Dk: 4.1	íi.	3 Plastic Drums x 30 L 1 Fibreboard box x 10 kg	813 430	
UN1263 UN1263	Paint Painte Vehicle, flammable liquid	3 3 9	II TH	2 Fibreboard boxes x 4 L 1 Fibreboard box x 30 L 1 automobile 1350 kg G	305 309 900	
	powerea Chemical kits Batteries, wet, filled with acid	8	11	1 Fibreboard pox x 3 kg 1 Wooden box 50 kg G	915 800	

Additional Handling Information

The packages containing UN3226 must be protected from direct sunlight, and all sources of heat and be placed in adequately ventilated areas. 24-hour Number: +1 905 123 4567

I hereby declare that the contents of this consignment are fully and I Name/Title of Signatory accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. I declare that all of the applicable air transport requirements have been met.

B.Smith, Dispatch Supervisor Place and Date Youngville 1 January 2009 Signature

SHIPPER'S DECLARATION FOR DANGEROUS GOODS Shipper Air Waybill No. 800 1234 5686 ADVANCED CHEMICAL CO. 345 MAIN STREET Page 1 of 1 Pages REIGATE, SURREY, ENGLAND Shipper's Reference Number 1213 / A12 (optional) Consignee For optional use ABC Coltd. 1000 HIGH STREET Company logo name and address ATHENS, GREECE Two completed and signed copies of this Declaration must be handed to the operator. Failure to comply in all respects with the applicable TRANSPORT DETAILS Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This shipment is within the Airport of Departure limitations prescribed for (delete non-apolicable) LONDON PASSENGER AND CARGO AIRCRAFT Shipment type: (delete non-applicable Airport of Destination ATHENS NATURE AND QUANTITY OF DANGEROUS GOODS

	Dangerous Goods Identificat					
UN or ID No.	Proper Shipping Name	Class or Division (Subsidiary Risk)	Pack- Ing Group	Quantity and type of packing	Packing Inst.	Authorization
UN2916	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE	7		IRIDIUM - 192 SPECIAL FORM 1 TYPE B(U) PACKAGE X 1.925 TBq	III-YELLOW TI 5.0 DIM 30x30 x40CM	SPECIAL FORM CERTIFICATE Nº 9999 TYPE B(U) PACKAGE CERTIFICATE UKIYZBÍ B(U)S ATTACHED

Additional Handling Information

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. I declare that all of the applicable air transport requirements have been met.

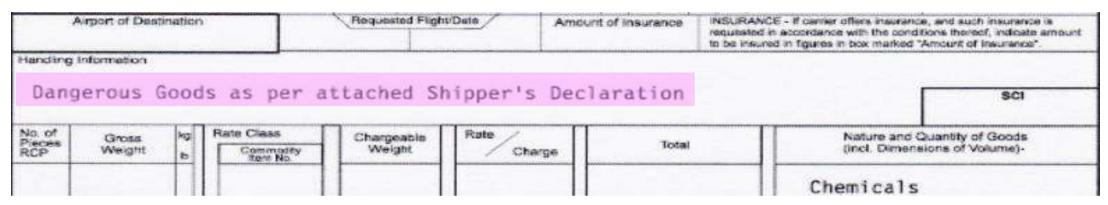
Name/Title of Signatory A. BROWN, SHIPPING MANAGER Place and Date REIGATE, 1 JAN 2009

Signature

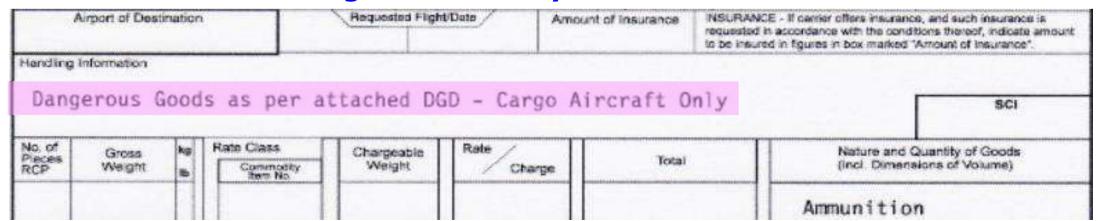




- > Air Waybill:
- √ The air waybill must contain a statement to indicate that the dangerous goods are described on an accompanying dangerous goods transport document (DGD)



√The air waybill must, when applicable, indicate that the consignment
must be loaded on cargo aircraft only









Thank you for your attention



Your safety is our mission.









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